

Health-related quality of life and satisfaction with care among older men treated for prostate cancer with either radical prostatectomy or external beam radiation therapy

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Accepted for publication 21 November 2005

OBJECTIVE

To analyse health-related quality of life (HRQoL) and satisfaction with care across potential curative treatments for older patients newly diagnosed with prostate cancer.

PATIENTS AND METHODS

In a prospective cohort study we recruited 115 older patients (≥ 65 years) newly diagnosed with prostate cancer from the urology clinics of an urban academic and a Veterans' Administration (VA) hospital. Patients completed generic (Short Form-36), prostate-specific (University of California Los Angeles Prostate Cancer Index) HRQoL, and Client Satisfaction with Care (CSQ-8) surveys before treatment with either radical prostatectomy (RP) or external beam irradiation (EBRT) and at 3, 6 and 12 months afterward. Clinical and demographic data were obtained via medical chart review. A repeated-measures analysis of

variance was used to examine changes in generic and prostate cancer-specific HRQoL between treatments. Log-linear regression was used to analyse the factors associated with 12-month HRQoL scores, and Kaplan-Meier survival curves were used to compare the return to baseline values for HRQoL

RESULTS

The RP group had significantly higher income, education and better general health than the EBRT group. Age (odds ratio 0.5, 95% confidence interval 0.32–0.82), non-VA hospital (28.8, 2–402) and prostate-specific antigen level at diagnosis (2.8, 1.05–7.5) were associated with RP. The analysis results indicated that the RP group had higher scores for generic HRQoL subscales of physical function ($P=0.019$), role emotional ($P=0.037$), vitality ($P=0.033$) and general health ($P=0.05$) than the EBRT group. A log-linear regression model for predicting the 12-month scores showed that RP was associated

with higher scores for most of the generic HRQoL and bowel function (odds ratio 1.12, $P=0.03$), urinary bother (1.6, $P=0.014$) and bowel bother (1.5, $P=0.013$). Being older was associated with a lower score on bowel function (0.98, $P=0.05$) and sexual function (0.92, $P=0.05$). Satisfaction with care was comparable between treatment groups at baseline and at the follow-up.

CONCLUSIONS

Older patients tolerate RP well from the HRQoL perspective and thus decisions for therapy in this age cohort should not be based primarily on age.

KEYWORDS

prostate cancer, health-related quality of life, satisfaction with care, prostatectomy, external beam radiation

INTRODUCTION

Prostate cancer is the leading cancer diagnosed among older men in the USA, with a median age at diagnosis of 72 years [1]. The ageing of the population and exponential increase in the incidence of prostate cancer are important factors that will affect future morbidity and mortality from the disease [2]. Due to uncertainty in screening and treatment, debate on outcomes such as quality of life (QoL) continues [2–9]. Assessing the effects of different treatments for prostate cancer on the health-related QoL (HRQoL) of older patients has significant clinical and health policy implications. Radical prostatectomy (RP) and external beam

radiation therapy (EBRT) are the most common curative treatments for older men with locally (advanced) prostate cancer. In the present prospective study we analysed the baseline characteristics associated with the treatment of older men with prostate cancer (RP or EBRT) and assessed their short-term effects on generic and prostate cancer-specific HRQoL and satisfaction with care, controlling for stage of cancer at diagnosis and comorbidity.

PATIENTS AND METHODS

A prospective cohort design was used to recruit 115 older patients (≥ 65 years) newly

diagnosed with prostate cancer. Patients were recruited into the study after completing the informed consent and Health Insurance Portability and Accountability Act (HIPAA) forms. The study was reviewed and approved by the institutional review board. All personnel involved in the conduct of the study completed subject-protection training and met the appropriate HIPAA education requirements before engaging in this research.

To assess generic and prostate cancer-specific HRQoL and satisfaction with care at baseline, participants completed the Short Form-36, the University of California Los Angeles Prostate Cancer Index (UCLA-PCI) and Client

Satisfaction with Care (CSQ-8) surveys during enrolment or via mail within 1–2 weeks after their enrolment into the study. All three self-assessment survey instruments have been extensively studied and validated [10–12]. Participants also completed these self-administered surveys at 3, 6 and 12 months after treatment. A structured medical chart review was used to collect demographic data (age, ethnicity and health insurance) and clinical data such as histological grade of the tumour using Gleason score, TNM stage of cancer, PSA level at diagnosis, follow-up PSA level, and comorbidity. Prostate cancer treatment was classified as RP (RP as monotherapy and multimodal therapy) vs EBRT (monotherapy and multimodal therapy). The baseline Charlson comorbidity score (CHS) was computed using International Center for Disease-9 codes for all inpatient and outpatient events [13]. The CHS is a medical record-based system, designed to predict death in longitudinal studies, with an integer score representing increasing level of the burden of illness [13].

Study participants were older men (≥ 65 years) diagnosed with prostate cancer and were recruited within 4 months of their diagnosis or before treatment. They were identified and recruited at the urology clinics of an academic medical centre and a Veterans Administration (VA) medical centre between February 2002 and July 2004. A patient was ineligible if he had visited these clinics for a second opinion only and not for continued care, was medically unstable or disoriented and/or if he was unable to communicate in English.

Initial information about the study was provided to potential participants by their urologists during clinic visits. A study research assistant then contacted those who had expressed an interest in participating in the study. Also, attendees of the weekly prostatectomy orientation class were contacted after the meeting. Those interested completed the informed consent form and HIPPA form. During study enrolment, participants were informed about the importance of continued and active participation. Of the total 115 participants enrolled into the study, 107 completed the 3-month, 105 the 6-month and 102 the 12-month follow-up surveys.

Generic and prostate-specific HRQoL subscale raw scores were converted to a scale of 0–100, a higher score indicating a better QoL.

Similarly, a higher score on the CSQ-8 indicates greater patient satisfaction with care. The *t*-test and chi-square test were used to compare demographic and clinical variables between treatment groups. A backward stepwise logistic regression model was used to identify predictors of treatment. Covariates were age, CHS, TNM stage, Gleason score, PSA score, race, marital status, education and type of hospital. The mean HRQoL at baseline and at 3, 6 and 12 months was compared between the RP and EBRT groups. Backward stepwise log-linear regression was used to determine the predictors of 12-month scores on prostate-specific and generic HRQoL domains. Covariates were age, ethnicity, CHS, marital status, education, baseline score, treatment group and TNM group. The following variables were dichotomized: race (1, Caucasian; 0, African-American); marital status (1, married; 0, other); education (1, high school or less, 0, more than high school); treatment group (1, RP; 0, EBRT); and TNM group (1, T1a–T2a; 0, T3a–T3b). A repeated-measures ANOVA was used to analyse the impact of treatment on generic and cancer-specific HRQoL. As a measure of recovery after treatment, we compared 'return to baseline' for each subscale of generic and cancer-specific HRQoL. During the follow-up a participant was considered as having 'returned to baseline' for a given HRQoL domain if the difference in scores between baseline and follow-up was a clinically significant difference of ≤ 7 points [10,14]. We compared the proportion of patients 'returning to baseline' across treatment groups at 3, 6 and 12 months of follow-up for the generic and cancer-specific HRQoL subscales using chi-square analysis and Kaplan–Meier survival analysis.

RESULTS

A comparison of demographics, signs and symptoms by treatment group is presented in Table 1. The RP group had a higher percentage of participants who were Caucasian, college-educated, currently working full-time, married and had an annual income of \geq US \$40 000. The overall mean (SD) age at diagnosis was 69.5 (4.5) years and the RP group, at 67.4 (1.5) years, was younger than the EBRT group, at 71.5 (3.5) years ($P < 0.001$). Prostate-specific signs and symptoms were comparable between the treatment groups,

except for blood in the urine, pain or aches in the back, hips or legs, and more tired or worn out than usual, which were reported by higher proportion of the EBRT group. Table 1 also presents a comparison of the clinical characteristics. The CHS, PSA level at diagnosis, PSA level after treatment and TNM stage were comparable between the treatment groups. For the EBRT group, a higher percentage of participants had a Gleason score of 2–6 and 8–10.

As the baseline demographics and Gleason scores were different between treatment groups, we used a backward stepwise logistic regression to analyse the predictors of treatment (RP vs EBRT), which indicated that age (odds ratio (OR) 0.5, 95% CI 0.32–0.82), non-VA hospital (28.8, 2–402) and PSA score at diagnosis (2.8, 1.05–7.5) were associated with the type of RP treatment. None of the other covariates, e.g. race, CHS, Gleason score and TNM stage of cancer, were associated with the treatment.

A comparison of baseline generic and prostate cancer-specific HRQoL between groups is presented in Table 2. The RP group had higher baseline scores on physical function, role physical, social function and overall general health, and bodily pain was lower in the RP group. However, the groups were comparable in terms of role emotional, vitality and mental health. For cancer-specific HRQoL, the RP group reported higher scores on urinary function, bowel function and bowel bother. The EBRT group reported higher scores on sexual bother, whereas both groups had comparable sexual function and urinary bother.

A longitudinal assessment of generic HRQoL scores and progression after treatment for mean scores on the generic HRQoL is also shown in Table 2. The pattern of progression for physical function and role physical differed between treatment groups. The RP group reported an improvement after an initial decline at 3 months and had values similar to baseline by 12 months. However, the EBRT group did not show an improvement over baseline values. For the subscale of role emotional, the decrease in scores at 3 months was greater for RP patients, and the scores improved thereafter, and by 12 months were higher than their baseline values. The EBRT group showed a continued decline in role emotional and a significantly lower score on role emotional. Both treatment groups had a

TABLE 1 Comparisons of the demographic characteristics, signs and symptoms at baseline, and the clinical characteristics and type of treatment received, for 115 men with prostate cancer

Covariates, %	RP (n = 69)	EBRT (n = 46)	P
Age, years			
65–75	100	79.6	0.004
75–85	0	20.4	
Caucasian	97.2	65.3	<0.001
African-American	2.8	34.7	
Education			
High school or less	27.8	49	0.050
College or more	72.2	51	
Marital status			
Single/widowed/divorced	8.3	38.8	0.002
Married	91.7	61.2	
Employment			
Full-time	22.2	8.1	0.066
Part-time/other	77.8	91.9	
Income level			
>\$40 000	77.1	38.3	<0.001
≤\$40 000	22.9	67.7	
Hospital type			
Non-VA	5.4	53.1	<0.001
VA	94.6	46.9	
Signs and symptoms (%)			
Difficulty/discomfort urinating	13.5	30.6	0.06
Having to urinate too often	43.2	58.3	0.16
Weak urinary stream	37.8	50.0	0.26
Infection of bladder or prostate	8.1	8.3	0.97
Blood in urine	0	10.4	0.04
Pain or aches in back, hips or legs	21.6	50.0	0.007
More tired or worn out than usual	16.2	35.4	0.04
Clinical characteristics and treatment			
PSA level, ng/mL			
At diagnosis			
0–4.9	36.1	31.1	0.322
5–9.9	47.2	37.8	
>10	16.7	31.1	
After treatment			
0–4.9	100.0	97.6	0.339
5–9.9	2.4	0	
>10.00	0	0	
Gleason score (total)			
2–6	56.8	72.3	0.003
7	43.2	14.9	
8–10	0	12.8	
TNM stage			
T1a	2.8	2.2	0.495
T1b	0	2.2	
T1c	72.2	62.2	
T2a	11.1	24.4	
T2b	5.6	0	
T2c	2.8	2.2	
T3a	5.6	4.4	
T3b	0	2.2	
CHS			
0	44.1	46.5	0.821
1–3	26.5	30.2	
>3	29.4	23.3	

decrease in vitality scores at 3 months and scores for the RP group improved thereafter. However, for the EBRT group the scores improved by 6 months and declined again by 12 months. For mental health, scores at the time of diagnosis were comparable between the groups. At 12 months after treatment, the RP group had a higher level of mental health than the EBRT group. For social function, bodily pain and general health the RP group reported higher scores at baseline and these remained higher through the follow-up and at 12 months than in the EBRT group. At 12 months after treatment the RP group reached baseline values for social function and general health, whereas the EBRT group reported a significant decline in social function and bodily pain. The repeated-measures ANOVA model showed that the RP group had higher scores for the generic HRQoL subscales of physical function ($P = 0.019$), role emotional ($P = 0.037$), vitality ($P = 0.033$) and general health ($P = 0.050$) than the EBRT group, controlling for baseline scores. Also, the mean changes in score across time on role physical ($P < 0.001$), vitality ($P < 0.001$), mental health ($P = 0.041$), social function ($P < 0.001$) and bodily pain ($P < 0.001$) were significantly different. The effect of treatment depended on time for the subscale of role physical, vitality and social function (all $P < 0.001$).

The scores on the prostate cancer-specific HRQoL are also given in Table 2. Urinary function consists of five items and urinary bother of one. Bowel function consists of four items (rectal urgency, loose stools, distress with bowel movement and abdominal pain) and bowel bother of one. The UCLA-PCI measures sexual function by combining eight items, and sexual bother by one item. For the RP group the score on urinary function declined at 3 months and improved thereafter. For the EBRT group the score stayed somewhat constant over time. Although the score on bowel function declined slightly at 3 months in the RP group, by 12 months it returned to the baseline level. For the EBRT group the score at 12 months remained less than at baseline. For both treatment groups the score on sexual function declined over the 12 months, but more so in the RP group. However, although both treatment groups had a decline in the urinary bother score over the 12 months it was greater for the EBRT group. The bowel bother score at 12 months was better than baseline scores for the RP group; for the EBRT group it tended to decline over the

TABLE 2 Mean (SD) HRQoL scores at each time point and in each treatment group

HRQoL	Baseline		3 months		6 months		12 months	
	RP	EBRT	RP	EBRT	RP	EBRT	RP	EBRT
Generic								
Physical function	67.7 (23.8)	54.6 (32.1)*	62.1 (19.7)	48.9 (24.9)*	69.9 (14.4)	47.6 (23.4)*	69.8 (15.4)	49.8 (24.2)*
Role physical	87.8 (35.6)	59.9 (56.6)*	46.2 (43.8)	52.7 (46.7)	81.4 (36.0)	60.0 (45.6)*	86.9 (24.2)	56.8 (44.4)*
Role emotional	88.9 (36.0)	77.3 (47.1)	75.5 (38.8)	66.7 (40.6)	93.3 (21.1)	66.7 (45.9)*	95.2 (15.7)	70.3 (41.1)*
Vitality	70.6 (16.9)	64.8 (28.5)	54.9 (20.5)	56.8 (23.9)	75.2 (19.4)	57.9 (27.6)*	74.1 (18.3)	54.4 (26.5)*
Mental health	78.9 (15.2)	77.0 (16.5)	75.5 (15.2)	76.9 (14.9)	83.0 (10.7)	76.7 (17.5)	85.4 (10.7)	78.8 (17.8)*
Social function	92.6 (13.9)	83.6 (22.1)*	69.1 (26.5)	73.1 (27.2)	90.7 (15.3)	75.3 (29.8)*	92.9 (13.8)	75.0 (28.7)*
Bodily pain	89.7 (15.9)	76.2 (25.4)*	71.8 (25.7)	66.2 (28.2)	88.8 (15.5)	68.3 (29.3)*	86.1 (19.6)	70.4 (25.9)*
General health	74.1 (18.0)	59.4 (24.0)*	71.6 (20.3)	56.8 (22.1)*	75.1 (17.7)	57.1 (25.3)*	73.5 (18.8)	56.9 (24.7)*
Prostate cancer-specific								
Urinary function	92.4 (13.9)	84.6 (15.5)*	51.7 (27.9)	83.7 (20.5)*	69.2 (28.5)	84.3 (16.8)*	77.1 (19.6)	83.0 (22.2)
Bowel function	92.9 (6.5)	86.3 (16.7)*	87.6 (15.2)	82.0 (18.2)	90.7 (13.2)	81.3 (19.8)*	92.2 (9.1)	81.5 (19.6)*
Sexual function	42.1 (24.0)	34.1 (31.5)	12.4 (16.0)	27.0 (24.9)*	12.8 (16.5)	22.1 (25.9)	21.7 (20.6)	24.4 (27.2)
Urinary bother	89.9 (18.1)	81.5 (26.1)	59.8 (26.5)	66.9 (31.8)	79.9 (29.8)	70.1 (30.7)	85.7 (18.4)	73.9 (28.4)*
Bowel bother	94.6 (10.4)	84.8 (20.7)*	86.0 (24.8)	81.1 (24.6)	94.4 (15.9)	83.1 (26.2)*	96.4 (10.4)	77.0 (29.7)*
Sexual bother	46.4 (38.4)	67.7 (38.8)*	32.4 (36.7)	54.5 (42.1)*	22.8 (31.6)	49.3 (41.6)*	32.7 (33.4)	46.1 (41.9)
Satisfaction with care								
	28.2 (3.7)	27.4 (3.5)	29.1 (3.0)	28.4 (3.2)	29.5 (2.8)	27.2 (6.8)	29.1 (5.9)	27.2 (5.7)

*P < 0.005.

12 months. For both treatment groups the score on sexual bother declined at 3 and 6 months; at 12 months the scores improved but they were not at baseline levels. Results of the repeated-measures ANOVA indicated that RP had a significant effect on the decline in score for the cancer-specific subscale of urinary function ($P < 0.001$), sexual function ($P = 0.002$) and sexual bother ($P = 0.012$), controlling for baseline values. The mean changes in score over time on urinary and sexual function (both $P < 0.001$), and urinary ($P = 0.042$) and sexual bother ($P < 0.001$) were significantly different. The effect of treatment depended on time for the subscales of sexual and urinary function (both $P < 0.001$), urinary bother ($P = 0.012$) and bowel bother ($P = 0.040$).

During the follow-up a participant was considered as having 'returned to baseline' for a given HRQoL domain if the difference in scores between baseline and follow-up was ≤ 7 points, which is considered to be a clinically significant difference [10,14]. Table 3 shows the comparison of the percentage of patients returning to baseline at 3, 6 and 12 months. For generic health at 12 months the RP group had a higher proportion returning to baseline on eight subscales than

the EBRT group. The difference between the groups was significant for physical function, role emotional and social function. For cancer-specific HRQoL at 12 months, the EBRT group performed better for urinary and sexual function, but the RP group had a higher proportion returning to baseline on bowel and urinary function and bowel bother. As shown in Table 3, 'censored' observations were those patients who did not 'return to baseline' during their 12 months of follow-up. The comparison of survival curves for return to baseline of generic HRQoL showed no significant difference between treatment groups. For cancer-specific HRQoL, urinary and sexual function had significant difference in return to baseline values (Fig. 1a,b).

The results of backward stepwise log-linear regression model (Table 4) for analysing the predictors of 12-month HRQoL, controlling for baseline values, indicated that RP was associated with higher scores for physical function (OR 1.26), role physical (3.3), role emotional (1.9), vitality (1.5), social function (1.2) and general health (1.3). A higher CHS was associated with a lower score on role physical (OR 0.83), vitality (0.95) and general health (0.95). Caucasian race was associated with improved role physical (OR 2.5), role

emotional (2.9) and lower bodily pain (1.4). Being married was associated with higher physical function (1.4) and less than high-school education with lower physical function (0.69). A higher TNM stage was associated with lower scores on role physical (OR 0.29), social function (0.64) and higher bodily pain (0.72). For cancer-specific HRQoL, RP was associated with higher scores on bowel function (OR 1.12), urinary bother (1.6) and bowel bother (1.5), indicating improved function. Being older was associated with lower scores on bowel and sexual function (0.98 and 0.92). Being married was associated with better scores on sexual bother (OR 4.2). A higher TNM stage was associated with lower scores on bowel function (OR 0.63), and urinary and bowel bother (0.33 and 0.19).

DISCUSSION

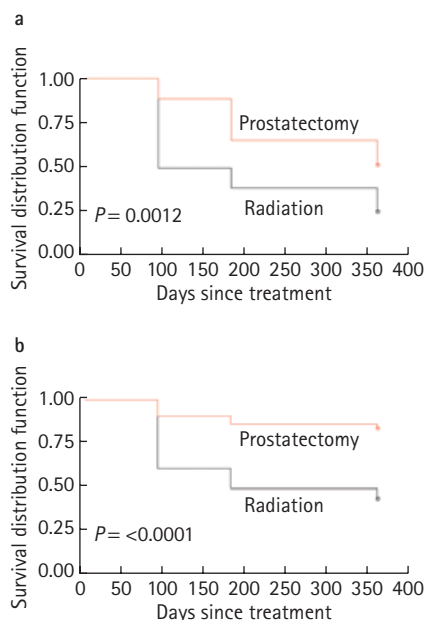
Older men with localized prostate cancer are offered many curative treatment choices and the process of treatment decision is complex [15,16]. Most patients who receive curative treatment require follow-up treatments of uncertain effectiveness [15-17]. In the present study we evaluated the impact of different treatments received by older men

TABLE 3 The percentage of patients returning to baseline scores at 12 months of follow-up, with the mean days to the return

HRQoL	3 months		6 months		12 months		Censored		Mean days	
	RP	EBRT	RP	EBRT	RP	EBRT	RP	EBRT	RP	EBRT
Generic										
Physical function	55.9	77.8	79.4	70.0	86.5	66.7*	8.1	18.4	167	172
Role physical	36.4	80.6*	78.8	86.8	83.8	75.0	5.4	12.8	184	158
Role emotional	70.6	71.4	87.9	76.3	94.4	69.8*	0	13.0*	140	170
Vitality	39.4	58.3	78.8	58.9	72.9	58.3	10.8	20.8	197	204
Mental health	66.7	75.7	90.9	67.5*	86.5	71.4	2.7	12.2	150	176
Social function	38.2	66.7*	78.8	69.2	83.8	62.5*	10.8	20.8	197	191
Bodily pain	38.2	59.5	75.8	55.0	72.9	61.2	18.9	26.5	206	205
General health	73.5	75.7	73.5	75.0	78.4	69.4	13.5	12.2	153	168
Prostate cancer specific										
Urinary function	15.1	71.4*	38.2	73.7*	43.3	64.5*	43.2	13.0*	274	181*
Bowel function	70.6	64.7	76.5	64.9	81.1	68.9	8.1	17.8	150	192
Sexual function	12.1	67.9*	15.1	58.1*	16.7	60.5*	80.6	23.1*	320	191*
Urinary bother	27.3	47.1	67.6	52.6	70.3	60.0	24.3	26.7	221	232
Bowel bother	79.4	82.4	88.2	81.1	91.9	68.9*	0	6.7	133	156
Sexual bother	56.2	64.3	48.4	53.3	48.6	51.3	31.4	32.5	210	211

*P < 0.005.

FIG. 1. Return to baseline at 12 months for: **a**, urinary function and **b**, sexual function.



with prostate cancer on outcomes such as HRQoL and satisfaction with care. RP for early-stage prostate cancer had comparable outcomes in terms of generic and prostate-specific HRQoL. The main findings of the study were: (i) At the 12-month follow-up, the RP group had significantly better generic HRQoL scores than the EBRT group; (ii) there were

significant improvements in prostate-specific HRQoL domains, e.g. bowel function and bother and urinary bother at 12 months in the RP group; (iii) there was lower urinary and sexual function, and more sexual bother at 12 months in the RP group; (iv) the TNM stage of cancer and type of hospital (non-VA) was associated with the observed treatment pattern; and (v) there was no significant difference in satisfaction with care between the RP and EBRT group.

HRQoL plays an important and integral part of treatment decisions for prostate cancer [5,16,17]. Older men with early stages of cancer often live long after diagnosis and treatment, and desire to maximize their QoL [4,8,9,16,17]. While some studies showed that treatments for a given stage of prostate cancer vary by age [2,3,15] others have addressed the specific effect of treatment on HRQoL [6,8,18–37]. RP treatment is beneficial for patients with an estimated life-expectancy of >15 years [17,20]. Age has strong influences on treatment pattern; younger men prefer RP, middle-aged men prefer radiation therapy and older men prefer either no treatment or hormone therapy [1–8]. Since 1991, RP has been common for localized and regional stages of disease. Many studies have addressed the effect of treatments for prostate cancer on HRQoL outcomes, but very few have focused on outcomes in older men

diagnosed with early-stage disease. The function before treatment and primary treatment method were strongly associated with a decline in organ-system dysfunction and the time course of dysfunction [19,22,28,36]. In a cross-sectional study, Dahn *et al.* [35] showed that the level of physical activity was positively correlated with sexual function in patients with localized prostate cancer who had EBRT. Litwin *et al.* [29] reported a longitudinal study of 438 men diagnosed with early-stage prostate cancer and treated with either pelvic irradiation or RP, assessing the impact of these on sexual function and sexual bother. There was a comparable improvement in sexual function during the first year for both treatments but sexual function declined in the second year for the pelvic irradiation group, but not for the RP group. A retrospective study comparing QoL in 203 patients treated with RP and 257 with EBRT determined that patients who received RP more often had problems with urinary incontinence [30]. A long-term assessment of HRQoL of men receiving EBRT and brachytherapy showed that their prostate-specific HRQoL scores continued to decline, whereas RP patients remained relatively stable or improved slowly [23,24,38]. A prospective study of 72 Japanese men with prostate cancer and receiving RP showed that generic HRQoL had recovered by 6 months. A nerve-sparing RP gave better

recovery of sexual function and urinary incontinence than non-nerve sparing RP [37].

A study using the Cancer of the Prostate Strategic Urologic Research Endeavor database showed that among patients receiving RP, younger men were more likely to return to baseline values for continence, potency and physical health. The preoperative tumour characteristics did not appear to be associated with regaining baseline values in any HRQoL domains [39]. Alibhai *et al.* [8] used a decision-analytical Markov model to show that older men with moderately or poorly differentiated localized prostate cancer and few comorbidities might benefit from curative therapies in terms of improved life-expectancy and quality-adjusted life-years. A long-term study to compare the HRQoL of men treated with RP or EBRT found that at 5 years after treatment decreases in urinary, bowel and sexual function persisted for both treatment groups. The most dramatic decline in sexual function was in the EBRT group at 2–5 years, leading to a comparable score with the RP group [38].

The limitations of the present study are: (i) because there was no randomization the results might not be representative of all older patients receiving either RP or EBRT, and there is potential for inherited treatment bias; (ii) the follow-up was short (12 months); (iii) the sample was limited to two large healthcare systems and may not be representative of the general elderly population.

In conclusion, as screening for prostate cancer becomes more widespread more elderly men will be diagnosed at an earlier stage [1–3]. Age has been a significant factor in clinical decision-making for treating patients with prostate cancer; older men often have a wide variation of comorbid conditions, functional limitations and generic HRQoL that may affect their treatment pattern and outcomes. Thus, managing prostate cancer in this group requires a comprehensive assessment and multidisciplinary approach to maximize the HRQoL. Little information is available on the treatment-decision process in the older patients and how these decisions affect the HRQoL outcomes. The present results indicate that older patients appear to have a better tolerance for RP. The present study is a first step in analysing the complex interplay of the characteristics of patient and provider in the decision process and its effect on HRQoL

Model	Covariates	OR (SEM)	P
Physical function	Treatment (RP)	1.26 (0.30)	<0.001
	Married	1.42 (0.19)	0.053
	Education	0.69 (0.17)	0.001
Role physical	Baseline score	1.02 (0.003)	<0.001
	CHS	0.83 (0.07)	0.018
	Race	2.50 (0.39)	0.024
	Treatment (RP)	3.30 (0.32)	<0.001
	TNM stage	0.29 (0.55)	0.032
Role emotional	Baseline score	1.01 (0.004)	0.001
	Race	2.94 (0.45)	0.020
	Treatment (RP)	1.98 (0.35)	0.056
Vitality	Baseline score	1.01 (0.006)	0.091
	CHS	0.95 (0.02)	0.040
	Treatment (RP)	1.46 (0.09)	<0.001
Mental health	Baseline score	1.01 (0.002)	<0.001
	Baseline score	1.01 (0.002)	0.016
	Treatment (RP)	1.18 (0.09)	0.049
Social function	TNM stage	0.64 (0.15)	0.006
	Baseline score	1.01 (0.002)	<0.001
	Race	1.40 (0.10)	<0.001
Bodily pain	TNM stage	0.72 (0.13)	0.017
	Baseline score	1.01 (0.001)	<0.001
	CHS	0.95 (0.03)	0.042
General health	Treatment (RP)	1.30 (0.13)	0.040
	Age	1.03 (0.016)	0.052
	Baseline score	1.02 (0.003)	<0.001
	Treatment (RP)	1.14 (0.05)	0.027
Bowel function	Age	0.98 (0.007)	0.055
	TNM stage	0.63 (0.12)	<0.001
	Age	0.92 (0.04)	0.061
Sexual function	Baseline score	1.03 (0.006)	<0.001
	Treatment (RP)	1.57 (0.18)	0.014
Urinary bother	Education	1.45 (0.14)	0.013
	TNM stage	0.33 (0.25)	<0.001
	Baseline score	1.01 (0.003)	0.003
Bowel bother	Treatment	1.50 (0.16)	0.013
	TNM stage	0.19 (0.30)	<0.001
Sexual bother	Married	4.20 (0.55)	0.011
	Baseline score	1.02 (0.006)	0.001

TABLE 4
Predictors of HRQoL at 12 months, by backward stepwise log-linear regression

among older patients. Further research on the factors associated with long-term HRQoL of older patients from diverse hospital and treatment settings is critical for the effective management of prostate cancer.

ACKNOWLEDGEMENTS

Supported by the DOD Prostate Cancer Research Program DAMD17-02-1-0126

CONFLICT OF INTEREST

None declared. Source of funding: Department of Defense Prostate Cancer Research Program DAMD17-02-1-0126.

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Abbreviations: **RP**, radical prostatectomy; **EBRT**, external beam radiation therapy; **(HR)QoL**, (health-related) quality of life; **HIPAA**, Health Insurance Portability and Accountability Act; **UCLA-PCI**, University of California Los Angeles Prostate Cancer Index; **CSQ-8**, Client Satisfaction with Care; **CHS**, Charlson comorbidity score; **VA**, Veterans Administration.